OFFICE OF CONTRACT ASSURANCE
LAWRENCE BERKELEY NATIONAL LABORATORY

Internal Assessment

Of The

LBNL Performance-Based Environmental Management System

August 2007

Executive Summary

The Lawrence Berkeley National Laboratory (LBNL) Performance-Based Environmental Management System (EMS) was developed during 2003 and fully implemented during 2004. In 2005, the EMS program was reviewed by LBNL's Office of Contract Assurance and then by NSF International Registrations, Ltd. to determine: (1) whether all programmatic activities were completed, and (2) the level of effectiveness of the program. On November 16, 2005, NSF issued as Citation of Conformance that validated LBNL's implementation of an EMS. Based on the strength of the Laboratory's EMS and the results of these assessments, on December 28, 2005, the DOE Berkeley site manager sent a letter to DOE's Office of Science director confirming that the EMS fully conforms to EMS requirements under DOE Order 450.1, *Environmental Protection Program.*

The annual review of environmental aspects and identifying/updating significant impacts began in January 2007, followed by the process of developing/updating environmental management programs (EMPs). The program has been successful in the implementation of these activities, and all were performed to the satisfaction of the EMS Plan and the corresponding procedures. The Management Review conducted in March 2007 did not include the appropriate participants, and resulted in a finding. Also noted in the assessment are two noteworthy practices and five observations

The EMS Program experienced several successes through the implementation of EMPs. In response to a 2005 Presidential directive on energy conservation, LBNL implemented EMPs to reduce electricity and natural gas usage. Also in the area of energy conservation, Facilities completed an EMP to perform a retro-commissioning study of Building 6 (Advanced Light Source facility). The purpose of this study was to identify and correct operational inefficiencies, verify energy use and improve design and construction practices at the facility. Facilities also completed an EMP to study LBNL commute traffic. Facilities Planning is coordinating a new EMP to continue the study and control commute traffic through Transportation Demand Management (TDM). Implementation of this EMP supports the Lab's efforts to satisfy commitments in the Long Range Development Plan's Environmental Impact Report. One of the multi-year EMPs is to reduce vehicle fleet petroleum consumption by 2% annually using FY05 as the baseline. The FY05 to FY06 reduction was 17%, far exceeding the 2% goal. Future petroleum reductions will be at a more moderate pace. Other ongoing EMPs include increasing procurement of Energy Star Products and Recycled Content Products, and tracking implementation alternatives for reducing diesel particulate matter (DPM) emissions.

Introduction

LBNL developed a Performance-Based EMS to satisfy the requirements of DOE Order 450.1, *Environmental Protection Program.* The LBNL EMS model is a systematic approach to ensure that environmental stewardship activities are well managed and provide sound business value. This order also established that the EMS must be integrated with the existing Integrated Safety Management (ISM) system.

The LBNL Performance-Based EMS Plan requires an annual internal assessment of the LBNL environmental management system. The internal assessment evaluated the implementation of the EMS against the requirements of the LBNL Performance-Based EMS Plan and supporting procedures. This included maintaining an active EMS Core Team, training appropriate staff, performing an environmental aspects review, creating EMPs, assessing the program and conducting a management review.

The assessment included interviews with a senior LBNL manager who is a member of the EMS Management Review Team, the EMS Core Team Leader, and EMS Core Team Members.

Description of the Assessment

Michelle Flynn of the Office of Contract Assurance performed the assessment. The opening and closing meetings were held, respectively, on July 31 and August 17, 2007 with Ron Pauer, Core Team Leader, and Kim Abbott, observer from the DOE Berkeley Site Office (BSO). Mr. Abbott also attended interviews of the Core Team Leader, LBNL senior manager, and two of the Core Team members.

Individuals interviewed were:

- Howard Hatayama, Environment, Health & Safety Division Director
- Ron Pauer, EMS Core Team Leader
- Steve Black, EMS Core Team Member
- Laura Chen, EMS Core Team Member
- Michael Dong, EMS Core Team Member
- Robert Fox, EMS Core Team Member
- Derrol Hammer, EMS Core Team Member
- John Speros, EMS Core Team Member

Documents and records reviewed were:

- LBNL Performance-Based EMS Plan
- EHS Procedure 271, Establishing the EMS Implementation Team
- EHS Procedure 272, Identification of Significant Environmental Aspects and Impacts
- EHS Procedure 273, Environmental Management Programs

- EHS Procedure 274, Training
- EHS Procedure 275, EMS Assessments and Audits
- EHS Procedure 276, Management Review
- EMS Training program
- EMS Training records
- Core Team meeting minutes
- Aspects worksheets
- EMPs and related documents
- Management review meeting minutes

Assessment Findings

The detailed assessment results are presented in the framework of the LBNL Performance-Based EMS Plan. Therefore, results are presented under the headings:

- EMS program
- EMS implementation team
- Identification of significant aspects and impacts
- Environmental management programs
- Training
- EMS assessments and audits
- Management review

Assessment results are categorized either as findings, observations, or noteworthy practices. Findings are deficiencies in conflict with the LBNL EMS Plan and associated procedures (EH&S Procedures 271-276). Observations are conditions that may lead to conflict with these program documents and also recommendations that may benefit the EMS program. Noteworthy practices are exemplary work activities or policies.

EMS Program

LBNL continues to integrate EMS with the existing ISM system. For example, the EMS Core Team Leader developed an Environmental Review and Self-Assessment Checklist, designed to assist divisions in reducing their environmental impacts and assessing performance. He also contacted each coordinator individually in order to foster the divisions' implementation of these activities. The Environmental Services Group (ESG) EMS website contains current information and includes the EMS Plan, the EMPs developed during the 2006-2007 EMS cycle, three EMS fact sheets and the internal assessment and third-party audit reports. The ESG website also contains the LBNL Site Environmental Report (SER), including a chapter on LBNL's EMS describing the program and status of EMPs. These web pages are accessible to LBNL staff and the public. LBNL's EMS was publicized via several articles in *Today at Berkeley Lab* regarding resource conservation, including energy and paper. The EMS Core Team

Leader also contributed to a *Berkeley View* article on energy awareness that discussed the accomplishments of the EMS program.

Observation: The EMS Plan and associated procedures should be updated to reference the new Executive Order 13423, *Strengthening Federal Environmental, Energy, and Transportation Management*, effective January 26, 2007.

EMS Implementation Team

The EMS Core Team, led by the Environmental Services Group Leader, designed, implemented, and maintains the EMS Plan. The team meets on a regular basis, approximately quarterly. Meetings are used to train Core Team members, identify significant aspects and impacts, and discuss implementation of the EMPs.

Noteworthy Practice: LBNL's allocation of resources to retain consultant Sue Sakaki demonstrates commitment to the success of the Lab's EMS. In addition to conducting initial and refresher EMS training, Ms. Sakaki educates the Core Team on developments in environmental management, beyond those within the DOE complex. Facilities Planning enlisted her to support the EMP for traffic congestion and the Transportation Demand Management (TDM) Plan, notable given Ms. Sakaki's breath of experience working with the local municipalities.

Identification of Significant Aspects and Impacts

The EMS team began the latest annual review of environmental aspects and determination of significant impacts in January 2007. These aspects involve waste generation and recycling, emissions and discharge, materials and resources use, and land and building development and use. The review process is documented in worksheets and aspects are characterized by the requisite factors, including amounts/size, health risk, limits, and goals. Aspects are then scored according to a prescribed list of significance categories.

Observation: Significance Categories on the Aspects/Impacts Worksheet differ from those listed in EH&S Procedure 272, *Identification of Environmental Aspects and Impacts*. This was noted in the 2006 EMS assessment.

Environmental Management Programs

EMPs are used as a formal planning tool and include information regarding tasks, responsibilities, timing, affected department, monitoring requirements, and metrics. The EMPs list objectives and targets established for each significant aspect.

Observation: Two individuals are listed on EMP-07-01A as coordinators, one is a Facilities Division EMS Core Team Member and the other a Facilities employee not trained in EMS. When interviewed, the Facilities EMS Core Team Member explained that he merely obtains energy monitoring data from the other individual, and will remove his name from the EMP.

Observation: Data collection to quantify the results of some EMPs remains a challenge:

- Energy savings data from duct sealing in Buildings 50A and 70 is unavailable. Balancing of the air handling systems in these buildings, scheduled for completion this calendar year, is a prerequisite to collecting the energy savings data.

- Water savings data before and after the Building 37 Dolphin system installation is unavailable. Data collection requires installation of a dedicated water meter for this building. Reporting of water savings from the Building 37 Dolphin system is subsumed by EMP 07-02A, Water Use.

- Data collection to support activities under EMP 04-05D [increase procurement of Energy Star Products (ESPs) and Recycled Content Products (RCPs)] continues to be an arduous task. It has been difficult to quantify ESP purchases because identification of procurements as such in the PeopleSoft system is currently not mandatory. Procurement plans to make the ESP designation a requirement later this calendar year.

Observation: Including a "last revised" field on the EMP form would aid in review of these documents.

Noteworthy Practice: Following an increase in sanitary (solid) waste generation over the past two years, the Lab solicited a site assessment of solid waste management by StopWaste.org. StopWaste.org is a public agency of the Alameda County Waste Management Authority and the Alameda County Source Reduction and Recycling Board. Based on results of the assessment, the EMS Core Team developed an EMP with a target to increase solid waste diversion, consistent with EO 13423.

EMS Assessments and Audits

Internal and external audits were conducted as required. In June 2005 and September 2006, the Office of Contract Assurance (OCA) conducted internal assessments, and NSF International Registrations, Ltd. conducted an audit in September 2005. Both internal assessments and the third-party audit included interviews of key EMS personnel and a review of all relevant documentation.

Observation: EH&S Procedure 275, *EMS Assessments and Audits,* specifies key EMS personnel to be interviewed. This assessment did not include an interview of the EH&S

Division Deputy director since he has been in the position less than one month. Nor did this assessment include an interview of the ISM leader. A description of the Lab's EMS was added to the institutional ISM Plan in September 2005, and the plan is currently under extensive revision. Consider revising this procedure making the list of interviewees less prescriptive.

Training

All Core Team members have attended comprehensive EMS training addressing EMS awareness, environmental aspects and impacts, determination of significance, and preparation of EMPs. The Core Team Leader has attended an EMS implementation training course presented by an external party, and most of the Management Review Team has received EMS awareness training. The internal auditor has attended EMS implementation and EMS auditor training.

No findings identified.

Management Review

The Management Review is intended to include staff with broad organizational responsibility and decision-making authority. The purpose is to provide a forum for discussion and improvement of the EMS and to provide management with a vehicle for making any changes to the EMS necessary to achieve the organization's goals.

Finding: The Management Review conducted in March 2007 did not include the appropriate participants; absent were both the Chief Operating Officer and the Chief Financial Officer. The Core Team Leader provided meeting minutes and copies of the handouts to all invitees, and offered to conduct follow-up sessions with the COO and CFO. Neither requested a follow-up meeting.
Recommendation: Conducting the Management Review at a standing senior laboratory management meeting, such as the Operations Senior Staff or Laboratory Support Advisory Council, would minimize the challenge of scheduling time with key personnel. Furthermore, broadening the audience for the Management Review may enhance awareness and ownership of LBNL's EMS, and provide a forum for senior laboratory leadership feedback on the EMPs.